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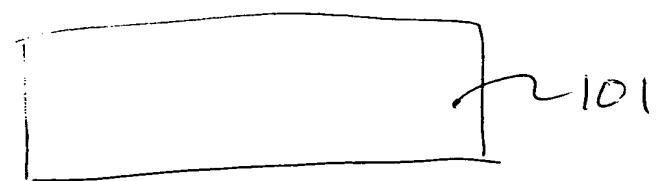


FIGURE 1

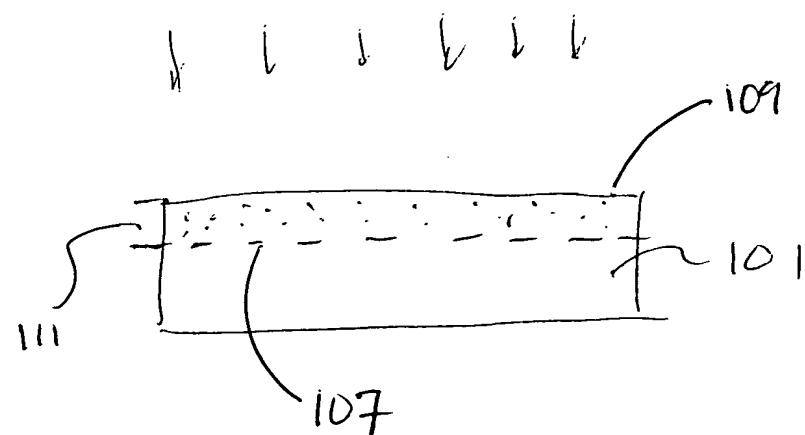


FIGURE 2

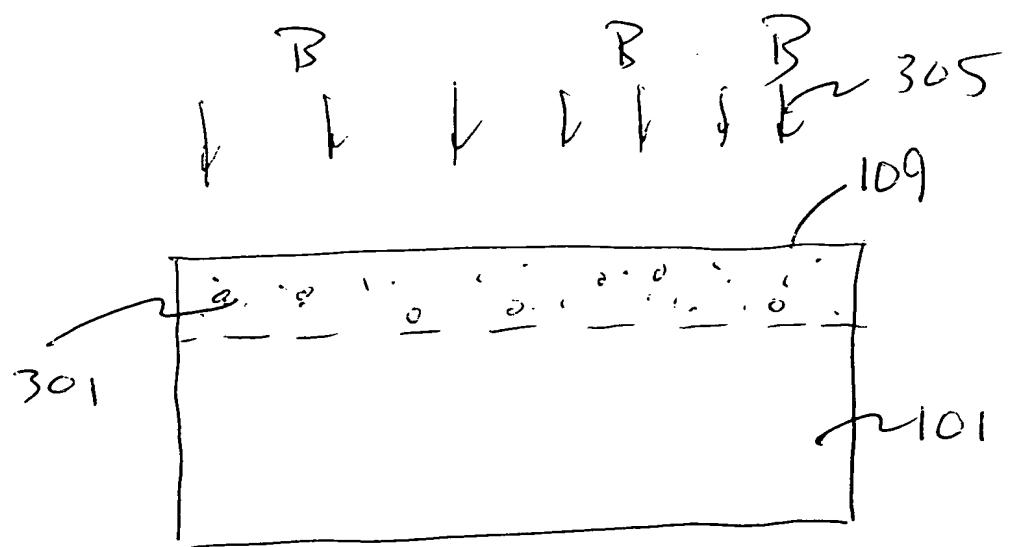
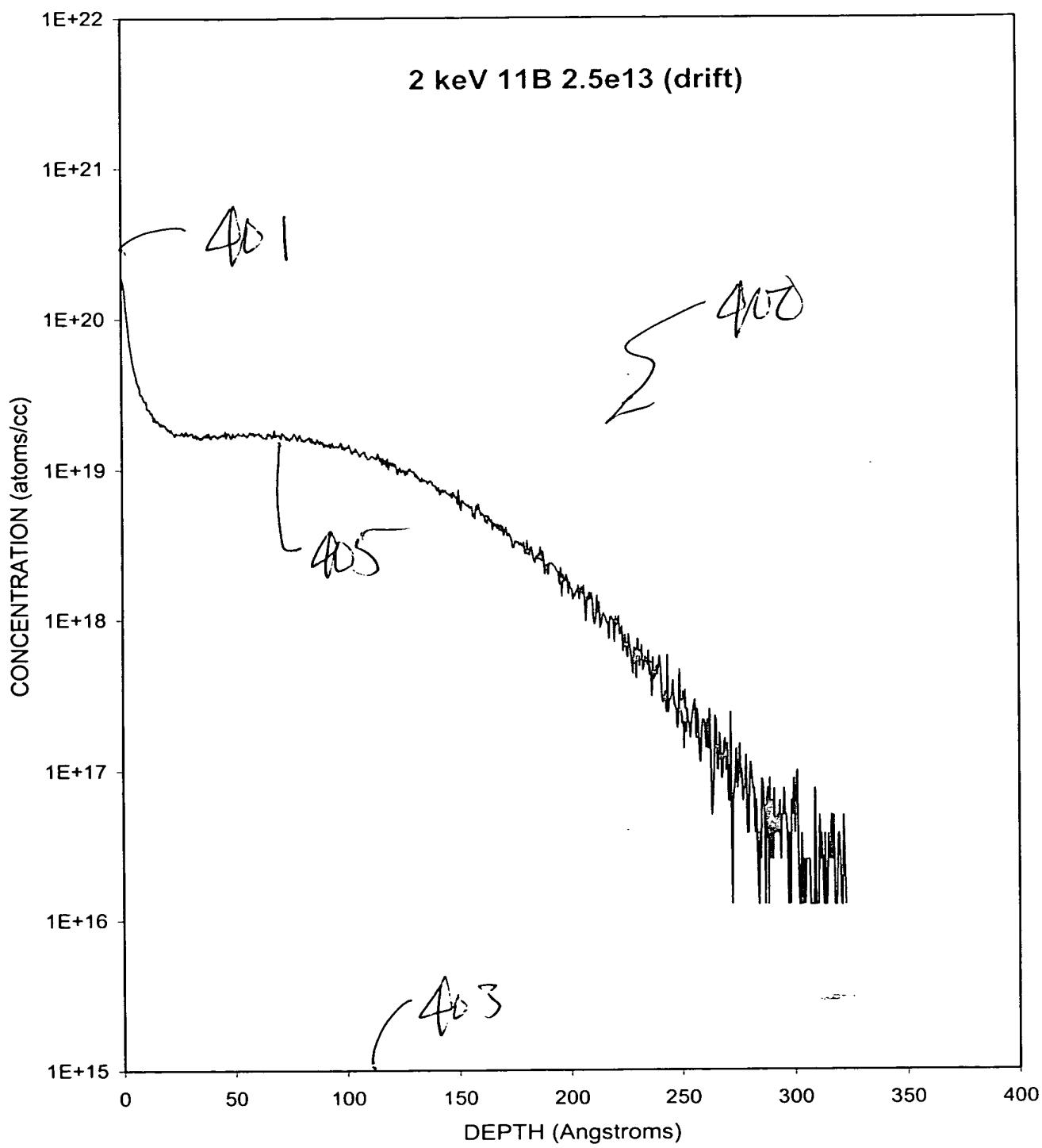


FIGURE 3

FIGURE 4



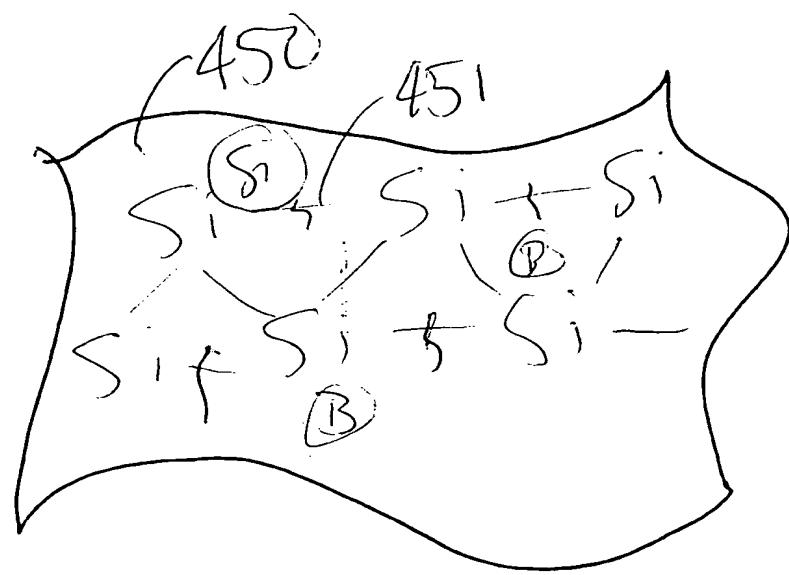


FIG. 4A

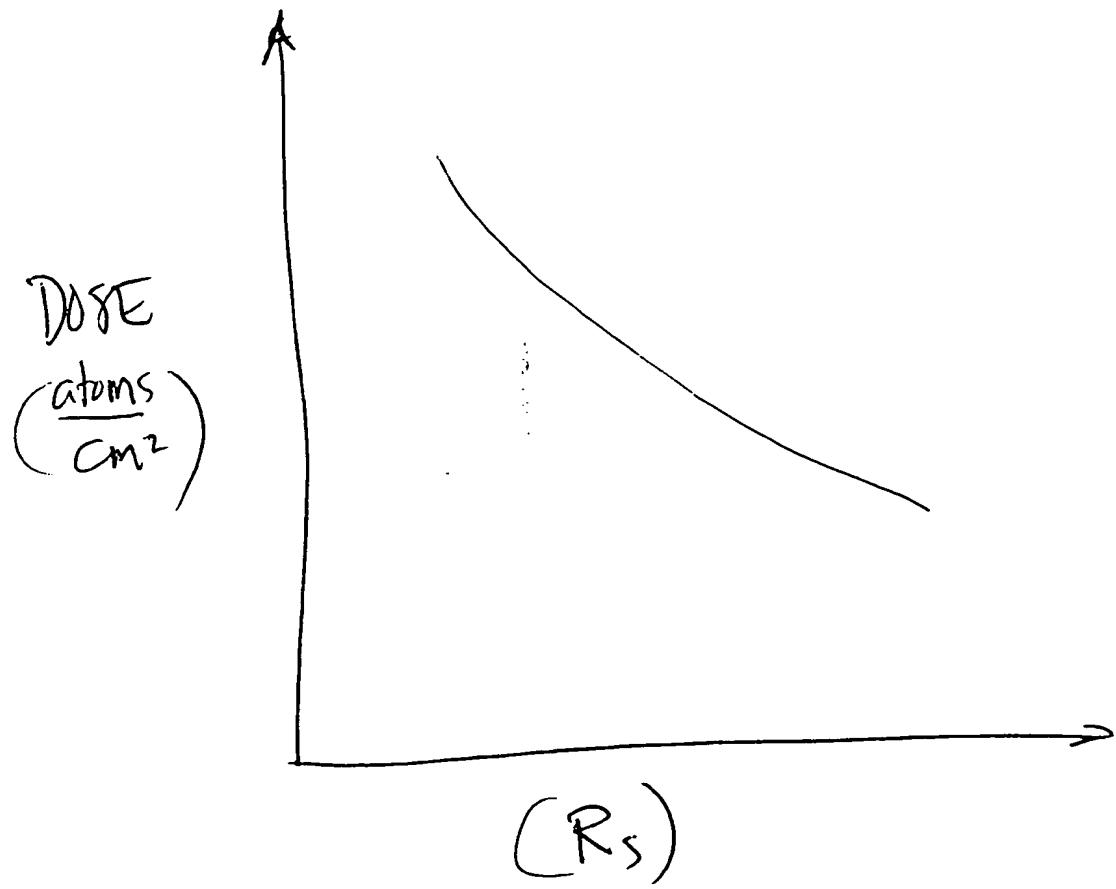


FIGURE 5

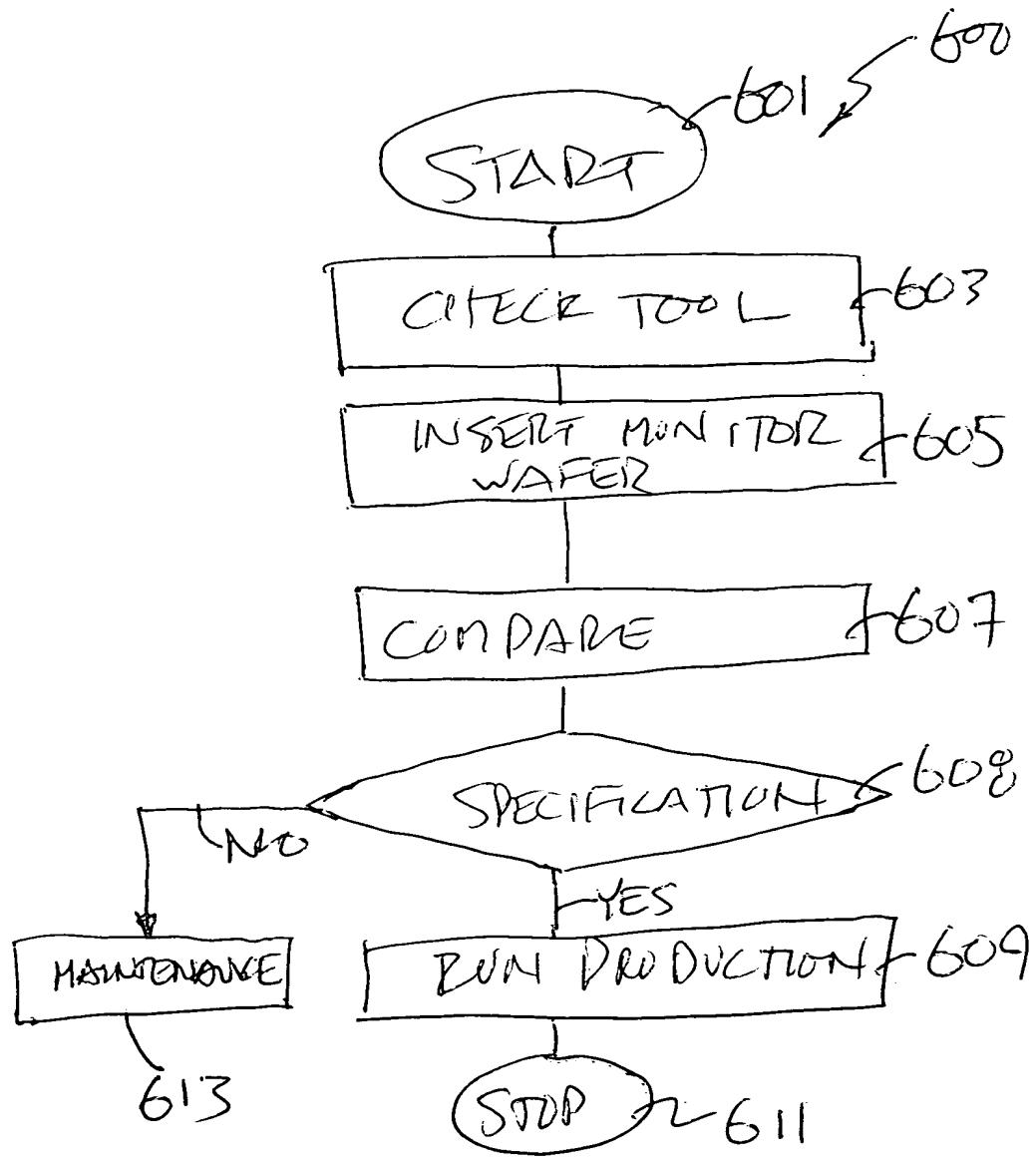


FIGURE 6

## Low energy implanter monitor

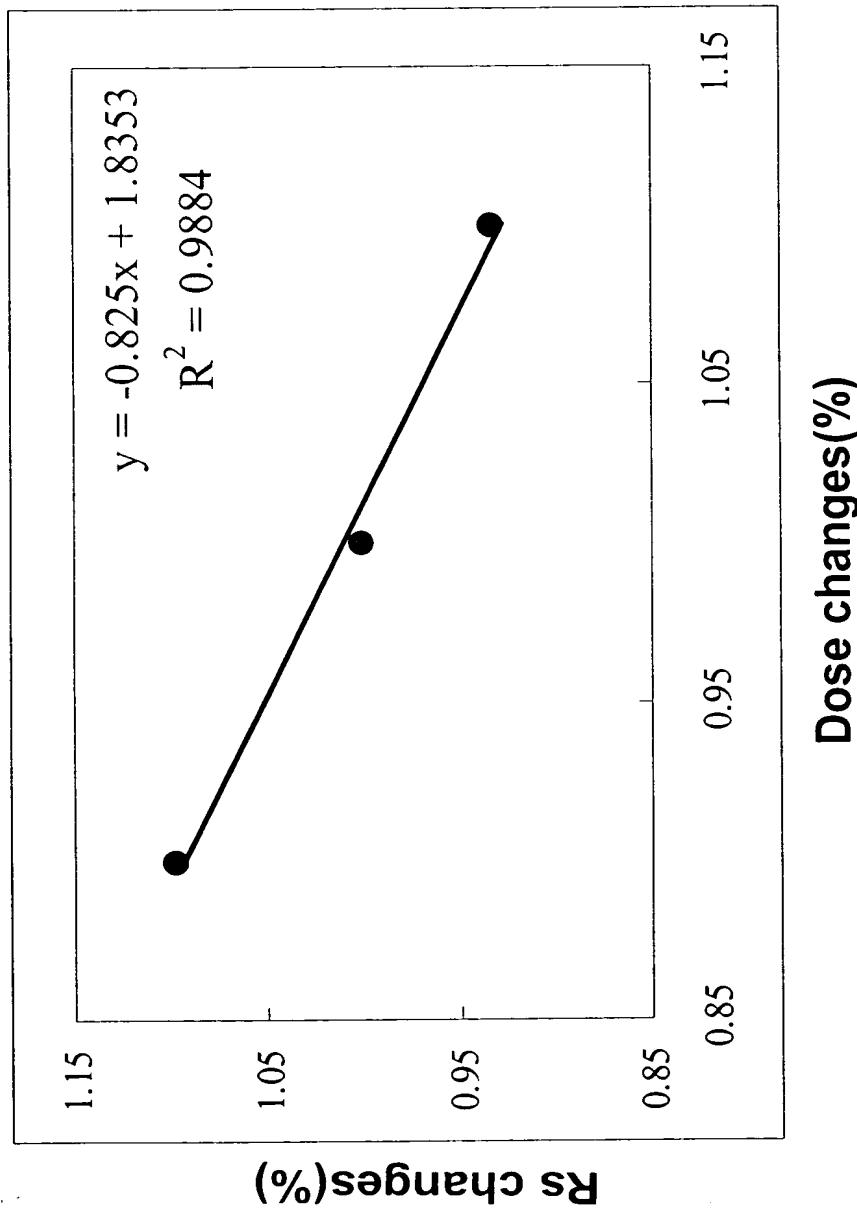


FIGURE 7

**Figure 1** Rs-to-dose sensitivity testing results. Implantation conditions:  
Silicon/20KeV/1E15 before Boron/2KeV/4E14; annealing conditions: 700°C,  
30 seconds, N<sub>2</sub> as annealing ambient.



# Low energy implanter monitor

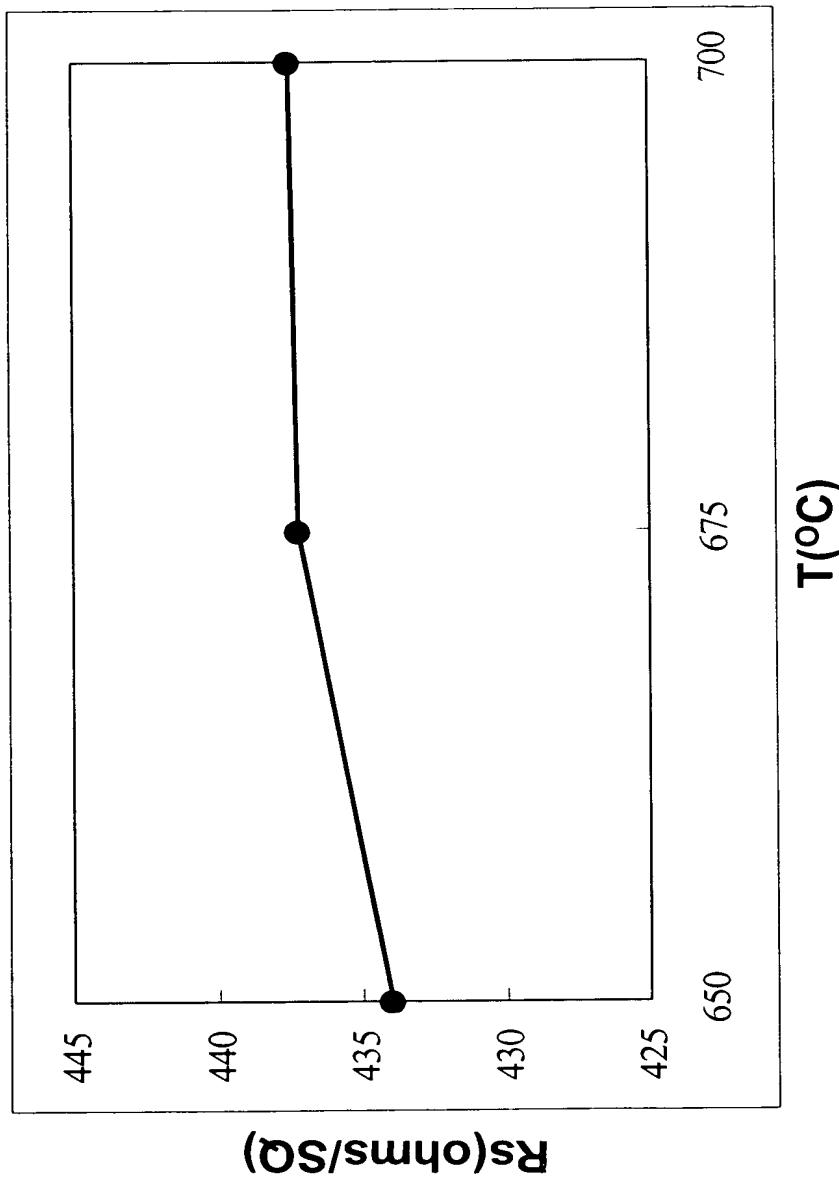


Figure 2

**Figure 2** Dependence of  $Rs$  changes upon annealing temperature. Implantation conditions: Silicon/20KeV/1E15 before Boron/2KeV/4E14; annealing conditions: from 650 to 700 $^{\circ}\text{C}$ , 30 seconds,  $\text{N}_2$  as annealing ambient



# Low energy implant monitor

**Table 1** The effect of silicon implantation on Boron activation. Implantation conditions: Silicon/20KeV/1E15 before Boron/2KeV/4E14; annealing conditions: 700°C, 30 seconds, N<sub>2</sub> as annealing ambient

	Implantation	Annealing	Rs/Uniformity(%)
Implanted with both Si and B	Si/20K/1E15/T07+ B/2K40E4/T00	T0700RTA30S	442.72/0.329%
Implanted with B only	B/2K/40E4/T00		7940.3/1.352%

flow

As shown in Table 1, implantation with Boron only shows very high sheet resistance, Boron implanted into the wafer was not activated. Silicon implantation before Boron implantation can be of much help for Boron activation, Rs of 442.7 ohms/SQ was obtained(uniformity: 0.33%).

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